

as their green plumage cannot be distinguished from the foliage. I have often stood beneath a tree full of them, without being able to see one. They roost in flocks. They have favourite roosting-places among lofty trees, where they assemble just before dark, and may be seen making for these common centres in great numbers, chattering and screaming as they fly.

[To be continued.]

XIII.—*On the Nidification of certain Birds in North-eastern Africa.* By BARON RICHARD KÖNIG VON WARTHAUSEN.

(Plate V.)

IN the following paper, the friends of Oology will receive descriptions of the eggs of certain birds of North-eastern Africa. They are nearly all as yet undescribed, and may prove to be of greater interest from the fact that most of them belong to species common to the European Fauna. Some of them came into my possession through the special kindness of Dr. Theodor von Heuglin, Austrian Consul at Chartum in the Sudan, who, also, has drawn the figures to illustrate the paper*; whilst the other specimens were collected by Herr Emile Wilke for me, and under the direction of Dr. Theodor von Heuglin.

I have used the old French duodecimal measurement in my descriptions.

1. *FALCO TANYPTERUS*, Licht. [*F. cervicalis*, A. Brehm et Heuglin (non Licht.): *F. biarmicus*, Brehm in Naumannia (non Temm.).]

This bird breeds in Egypt, on the Pyramids of Gizeh (Djiseh) and Dachschr, and on the Moxatam Mountains. Several nests, taken between the 14th and 26th of March 1858, contained from three to four fresh eggs. They are deposited, sometimes in a cleft on the naked stone, surrounded by a little sand only or by some small branches; sometimes in a deserted and restored nest of *Milvus parasiticus*, which bird breeds in the same locali-

* We much regret being unable to publish more than one of the nicely executed plates which were intended to illustrate Baron R. König von Warthausen's valuable paper.—ED.

ties. In other cases the bird itself builds a nest of branches, without much art, rather small and about $1\frac{1}{2}$ inch deep. But few of the eggs are elongate in shape; some are strongly rounded, and most of them have a stout oval form. The longest out of sixteen specimens is $23\frac{1}{2}$ lines long, $17\frac{1}{4}$ lines broad; the shortest and narrowest 21 lines long and $16\frac{3}{4}$ lines broad.

The eggs of this bird, compared with those of *Falco peregrinus* from Northern and Central Germany, North-eastern Russia, and the northern parts of America (*Falco anatum*, Bonap.), are generally lighter in colour, less red, and with more delicate markings. One specimen only, of a small size, is marbled with dark brownish-red; most of them are distinguished by a light ground-colour (sometimes dirty-white, sometimes brownish-yellow), and by fine, rounded, darker or lighter yellowish-brown spots, dots, and points. By the size alone, they cannot always be distinguished from those of the Peregrine, though they never attain to such a size as sometimes occurs in the eggs of that species. But there is a difference in the structure; for whilst the pores in the eggs of the Peregrine are less oblong and rather infundibuliform, those in the eggs of the present bird are more distinctly marked and serrated. The weight of the empty shell is between 58 and 73 grains.

The young birds are fledged in the beginning of May, and resemble those of *Falco lanarius*. Their tarsi have a remarkable dark bluish-green colour.

Three other eggs, strongly convex and taken from one nest*, differ from the former by their beautiful coloration and considerable size. They are $23\frac{3}{4}$ lines long, 18 or 19 lines broad, the ground-colour gradually changing from violet-red to flesh-colour and then to pale reddish-brown, with obsolete fine dots. At first I was inclined to consider these as a southern variety of the eggs of *F. lanarius*; but Heuglin assures me that this species does not breed in that locality, and that he has met with it in North-eastern Africa from October to March only. If this observation be correct, the eggs must belong to *F. tanypterus*, as it is impossible to refer them to *F. peregrinus*.

* There were four eggs in this nest.

The notice of a pair of *Falco lanarius* having bred on the Pyramid of Cheops in May 1851 (v. Heuglin, 'System. Uebersicht der Vögel N.-O. Afrika's') is erroneous, as has been admitted by the author of that report.

2. *FALCO ELEONORÆ*, Gén  . (*Falco arcadicus*, Linderm.)

Heuglin observed four adult pairs of this bird in the Archipelago of Dahalak, on the 30th August 1857, on a reef formed by madrepores, and shot two pairs of them. All the adult birds which he observed or shot were, contrary to Bonaparte's account and figure, uniform fumigated-grey with a whitish hue and a lighter throat.

There were three nests found, two of which were situated below prominent rocks, immediately above the surface of the sea, at a height of about 30 feet. The third was in a cleft of a rock in the middle of the cliff. They were not true nests, but only rather shallow cavities on the sandy surface, and contained, the first, two young ones and one egg; the second, two young ones; and the third, one young and one egg.

The only egg in my possession is 16 lines long and $13\frac{1}{2}$ broad, whereas Thienemann (Fortpflanzungsgesch. der V  gel, tab. 52. 8 *a, b.*), in accordance with the size of the bird, states the length to be $18\frac{1}{2}$ lines and the breadth 15 lines. My specimen, which has perhaps been altered by incubation, is of a nearly uniform yellowish-white, slightly spotted with reddish. I conclude from its small size that it is not fully developed. It is covered with dirt, and too imperfect to determine its weight. Fragments of the eggs from which the young ones were hatched are more or less distinctly dotted and spotted with reddish-brown, the ground-colour being reddish-yellow. The shell is delicate, in grain intermediate between that of *Falco tinnunculus* and *Falco subbuteo*.

The young birds have white down, and the naked parts of a reddish olive-colour. They all died before the juvenile plumage was completed; in this state they very much resemble *Falco subbuteo*. A broad black moustache is very distinct; the upper parts are dark grey, the margin and tip of each feather being reddish-ferruginous; the lower parts are reddish-ferruginous, with dark-brown spots along the shafts.

3. BUBO ASCALAPHUS*, Cuv. et Savign.

This species has been observed by Heuglin in Upper Egypt and Nubia in pairs and in small companies; it breeds also in Lower Egypt, where Wilke found two nests on the Pyramids of Abusir and Sakara on the 26th and 27th of March 1858. Each of the cavities scratched in the sandy surface, at a shadowy but not dark locality, contained three fresh eggs.

The eggs of the one brood are more elongate, those of the other more rounded; all having a very regular form, the greatest diameter passing through the centre, and the profile descending the poles sometimes in a more gentle, sometimes in a more abrupt elliptical curve. The length varies between 22 and 24 lines, the breadth between $18\frac{1}{2}$ and 20; the largest specimen is 24 lines long and 20 broad, the smallest 22 long and 19 broad; the weight is 48 to 60 grains.

They differ from the eggs of *Bubo maximus* in their smaller size and finer grain. The largest specimens of *Syrnium aluco* do not attain to the size of the smallest egg of our species; whilst the largest eggs of *B. ascalaphus* equal those of *Surnia nyctea*. The eggs of the latter species, however, differ in their greater weight and in their grain, the tubercular prominences in our species being more separated and not quite so flat, and the pores being relatively larger and deeper, and sometimes forming congregated groups.

4. STERNA SENEGALENSIS, Swains.

Heuglin has brought home specimens of birds and of eggs of this species, hitherto known only from the mouth of the Niger, Senegambia, Ashantee, and Corisko. He found them on the shores of the Red Sea, south of the Tropic, where they breed on cliffs and islands near Souakin, on the Amarat Islands, and on other isles of the archipelago of Dahalak (that is, between 15° and 16° N.L.), and probably also further southwards.

The eggs were found in the end of July and in the beginning of August on flat coral-reefs, close to the beach, in shallow cavities of three inches diameter, sometimes without such a

* *Bubo ascalaphus* of Egypt is very closely allied to, even if really distinct from, *B. bengalensis* of India.—ED.

cavity, on pebbles of chalk or fragments of shells. Each of the nests, found on the 27th of July and the 1st of August 1857, near Amarat and Dahalak, contained two new-laid eggs. They have the elongate-ovate or the shorter and somewhat tapering form by which the eggs of *Sterna* are always distinguished. Their usual length is from 17 to 18 lines, their usual breadth 12 to 13 lines; the smallest specimens are $15\frac{1}{2}$ to 16 lines long and $12\frac{1}{2}$ to 13 broad; the largest ones 16 to 17 lines long and $13\frac{1}{2}$ broad; the longest ones 18 to $18\frac{3}{4}$ lines long and $12\frac{1}{2}$ to $13\frac{1}{2}$ broad. The broadest eggs are therefore the shortest, and the longest the narrowest.

The shell is not shining, is very thin, and weighs from 16 to 19 grains; the surface is equally, finely, and prominently granulated. The ground-colour is greenish-yellow, greenish-grey, greyish-yellow, rarely light-brown or bluish-white, sometimes with a reddish shade. The spots are sparingly scattered over the shell, with sharp outlines, small, of a grey, brown, or blackish colour, the edges frequently having a violet hue; some of them are burnt-brown; the lightest ones are generally the largest, the darkest ones the smallest, in the form of points, streaks, and sometimes of lines. A few only out of about eighty specimens exhibit coarser spots; five are so dark as to resemble those of *Sterna hirundo*, and a single one has a uniform bluish greenish-white colour. They are all transparent bluish-green on the inner surface. Comparing them with eggs of other species of *Sterna*, we find the following differences:—

Their volume is twice or three times as large as that of the eggs of *Sterna minuta*, the coloration of both being exactly the same. Compared with the eggs of *S. arctica* and *S. hirundo*, they are on the average considerably smaller, lighter in weight, differently granulated, with paler (less green and brown) and finer markings,—the largest eggs of *S. senegalensis*, however, being equal to the smallest ones of the two species mentioned. Small eggs of our species are equal in size to, or even surpassed by the large ones of *S. hybrida*; but these, collected in N.W. Africa, Hungary, and S. Russia, exhibit the granulations more flattened, the ground-colour much more intense, and the markings considerably darker and frequently more crowded.

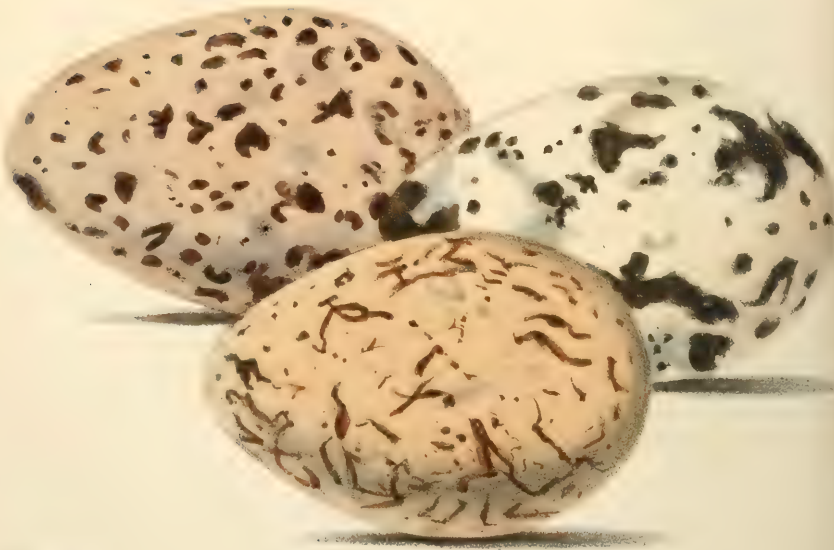
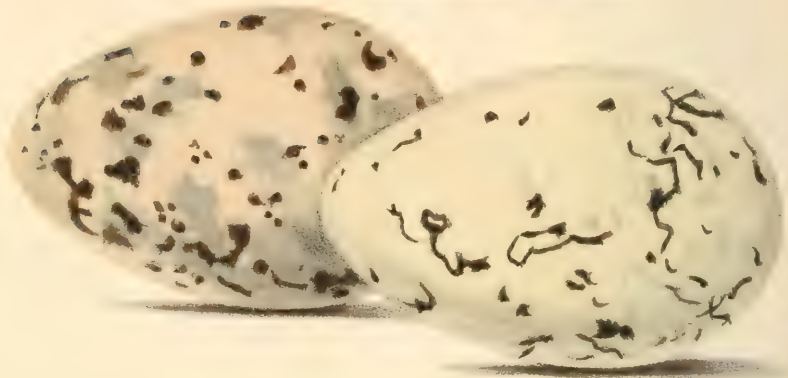


PLATE I. EGGS OF STERNA APOLLINIS

Fig. 1

STERNA VELOX

M. N. S. 1888

The Arabian fishermen stated that the old birds cover the young ones immediately after their being hatched.

5. STERNA AFFINIS, Rüpp. (Plate V. figs. 1, 2, 3.)

This species and the following agree with the former in locality, season, and other specialities of breeding,—being, however, much less frequent. They also breed in companies on the shore, but separately from each other and from *S. senegalensis*.

The average dimensions of eight eggs, collected near Amarat and on the island of Lobo (Archipelago of Dahalak), are 23 lines by 16. The weight of the shell varies between 36 and 44 grains. There are two principal varieties with respect to coloration:—(A) white or greenish-white with coarse spots, sometimes scattered, sometimes arranged in groups. The centre of each spot is violet-grey or blackish-grey, which colour passes into a beautiful chestnut-brown and dark-brown towards the periphery; the edges are generally burnt-brown. These eggs resemble those of *Cephus grylle*. (B) yellowish, sometimes with a reddish shade, dotted and striolated; the darkest points, dots, and streaks are black-brown or brownish-red; the margins of the spots shining brown or red. In one specimen bluish-grey spots form a zone round the base with many flourishes. All the eggs, held against a flame, are transparent yellowish-green.

Some of the eggs much resemble those of *Sterna cantiaca*; but they are all distinguished by the more variegated coloration, the smaller size, and the different structure, characterized by shallow, serrated pores, and by finely granulated rounded tubercles, which render some parts of the shell rather rough.

6. STERNA VELOX, Rüpp. (Plate V. figs. 4, 5, 6, 7, 8.)*

Of this species, which has the same peculiarities of breeding as the preceding two, I have fourteen eggs in a good state of preservation and five injured ones, collected on the island of Lobo, the 1st of August, 1857. They are distinguished from all the eggs of *Sterna* hitherto known, by their considerable size and their beautiful and very variegated coloration. Their

* This is the "Swift Tern" of British Lists, a specimen of it having been once killed in Ireland, as mentioned in Thompson's 'Birds of Ireland.'—ED.

length reaches 25–29, their breadth $17\frac{1}{2}$ – $18\frac{1}{2}$ lines ; their weight amounts to 54–70, generally to 60 grains. The ground-colour is greenish-white, greenish-grey, reddish-white, incarnate, or violet-rose. The greenish specimens have, as in *Alcatorda*, large blackish-brown burnt spots and grey clouds ; the reddish ones mostly smaller, rounded, sometimes also burnt spots, the colour changing from the centre to the margin as stated above, and frequently short and numerous flourishes of a chestnut-brown (rarely entirely black or light-brown) nearly red colour. In several specimens the flourishes are as large and as well-developed as in the finest eggs of *Uria troile*. Bluish-grey markings lie deeper in the substance of the shell, and sometimes little conspicuous in the whitish specimens ; they generally correspond to the external spots in size, form, and situation, and appear rarely as larger clouds in dotted eggs. One specimen is uniform greenish-white. Reddish eggs, held against a light, are transparent yellowish-green, greenish ones bluish-green. The granulation is strong, coarse, flat, labyrinthine, with rounded pores and deep pits.

7. ANOUS TENUIROSTRIS, Leach. (*Sterna senex*, Cranch.)

This species, observed by Rüppell in the Red Sea, and by others in West Africa, was found by Heuglin in about 11° N.L., on the Somali (Somauli) coast, on Bur-da-Rebschi (Arab. Djebel-Tiur), a rocky and very steep island, about 500 feet high. There thousands of them breed, the most efficient producers of the guano collected by the Somali fishermen, who state that their breeding-season is in May or June.

Heuglin found (14th Nov. 1857) some old eggs (which admitted of an imperfect preservation only, and some of which were discoloured by the light-brown adherent guano) on the surface and on the clefts of the rocks. Eight specimens were procured, of an elongate-ovate form, having a length of 21 to 24 lines, and a breadth of 14 to 16 lines. On the average they are 23 lines long and 15 broad ; the longest is the broadest. They are closely allied to the eggs of *Anous stolidus* with regard to size and coloration. They have a pale reddish-yellow, flesh-coloured or whitish ground-colour, and either only a few spots of rather

large size and of a pale violet-grey or brownish-grey colour, with some light-brown points besides; or the markings more distinct and numerous, grey and reddish-brown, sometimes shining dark-brown with lighter edges, or reddish-grey and reddish-brown, densely dotted on the obtuse end. As in most of the *Laridæ*, the spots are rounded and laterally produced. The shell, held against a light, is transparent yellow; its weight is about 35 grains. Their granulation is flat, somewhat resembling that of *Rhynchops*.

8. *LARUS HEMPRICHII*, Bp.

This bird breeds on the Amarat Islands, at a greater distance from the shore than *Sterna senegalensis*, in companies of six to ten pairs. Such a small colony was found by Heuglin on a plain of sand surrounding a hill and covered with salt-plants and bushes. The greater part of the young ones were hatched on the 27th of July, 1857. Three nests only, two with two eggs, and the third with one, all hard-set, remained. They lay in the sand beneath some bushes. The eggs, which are from 23 to $24\frac{1}{2}$ lines long and 16 to $17\frac{1}{2}$ lines broad, equal in size those of *Larus tridactylus*, the smallest eggs of *Larus canus*, and the largest ones of *Larus ridibundus*. The pale greyish-yellow, rarely brownish-yellow, sometimes greenish-grey ground-colour is speckled, dotted, and striolated with grey and pale-brown. They are moderately shining, and have a weight of 46 to 48 grains or more. The granulation is somewhat stronger than in *Larus ridibundus*, but not so strong as in *Larus canus*, and less uniform than in *Larus tridactus*.

The old birds endeavoured to lead away the attention of visitors from their offspring. The young birds have whitish down; they are hidden in the thick thorn-bushes immediately after their being hatched, and afterwards, before they are able to fly, brought into shallow water.

9. *LARUS LEUCOPHTHALMUS*, Licht.

When Heuglin examined the island of Perim (which has lately become of so great political importance), he found a high rocky part of it almost exclusively occupied by *Larus leucophthalmus*, which had selected that spot for breeding (17th

Sept. 1857). Two eggs containing mature embryos, which cannot be referred to any other species, were found under a bush. One of the specimens, procured for my collection, shows that the eggs are as closely allied to those of the preceding species as the birds themselves are to each other. It is 24 lines long and 12 lines broad; it has a darker and browner ground-colour, the grey and brown markings, and, besides, it is lineolated with blackish on the broad extremity. The grain equals that of the eggs of *Larus hemprichii*, but appears to be rather more strongly developed.

XIV.—*Additions and Corrections to the "Ornithology of Amoy."*

By ROBERT SWINHOE, of H.M. Consular Service.

MR. G. SCHLEGEL of Amoy (son of the renowned Dr. Schlegel of the Leyden Museum) having kindly lent me a copy of the 'Fauna Japonica,' I am enabled to make the following additions and corrections to my article on the "Ornithology of Amoy," published in the last number of 'The Ibis.'

CAPRIMULGI, sp. 13 and 14.

The first of these, I find, is akin to *C. jotaka* of the 'Fauna Japonica.' The most striking points of difference are as follows:—In three individuals of our species the wing is half an inch and the beak 2 lines longer. Instead of the second, third, and fourth quills in the male having a white band, ours has a white spot on the inner web of the first and a band across the second and third primaries only. The sides of the head, the greater and lesser wing-coverts, and the scapulars are fronted with white; and a narrow line of pure white runs from the bill to the top of the eye and extends in a broken manner beyond; but in most other respects our bird resembles *C. jotaka*,—the tail being banded with white, pretty much in the same style, and the tarsus feathered down to the base of the toes. I have named it for the present *C. dytiscivorus*, from its habit of feeding on *Dytiscidæ*, to which family belong several large insects taken out of the stomach of specimens which I have shot.